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| EXAMINER | | | | |
| CHACKO DAVIS, DABORAH | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 1795 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/671,864

Applicant(s)

KURT ET AL.

Examiner

DABORAH CHACKO DAVIS

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-7,9-11 and 13-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7,9-11 and 13-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date 10/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-2, 5-7, 9-11, 13-20, are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1, and 19, recite "...the composition containing (a) and (b), wherein (a) is one or more perchlorinated, perbrominated, or periodinated C₁-C₆ alkanes.." . The specification, as originally filed, does not disclose the claimed perchlorinated, perbrominated or periodinated C₁-C₆ alkanes. The specification only teaches perhalogenated C₁-C₆ alkanes, and that the perhalogenated C₁-C₆ alkanes are perfluorinated C₁-C₆ alkanes, wherein the preferred C₁-C₆ alkanes are perfluorinated C₁-C₄ alkanes in particular perfluoromethane and perfluoroethane. There is no suggestion that the perhalogenated alkanes can be perchlorinated, perbrominated or periodinated C₁-C₆ alkanes. The only sentence suggesting chlorine or bromine is for the composition containing (b) i.e., salts of nitrogen hydrides, wherein the salts include nitrogen, hydrogen, oxygen and halogen atoms, and that the halogen in the salts can be fluorine, chlorine or bromine, preferably fluorine. This preceding statement does not suggest or imply that the perhalogenated alkanes

include the newly recited alkanes recited in the amended claims 1, and 19. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 9-11, 13-17, 19-20, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,252,648 (Hase et al., hereinafter referred to as Hase) in view of U. S. Patent No. 6,968,850 (Chan et al., hereinafter referred to as Chan) and U. S. Patent No. 5,221,361 (Anton et al., hereinafter referred to as Anton).

Hase, in col 1, lines 7-20, in col 3, lines 25-67, and in figure 1, discloses an exposure apparatus (lithographic apparatus) for the manufacture of a semiconductor device, the apparatus includes a light source (radiation system) that provides a beam of light (ArF laser), a reticle that patterns the beam of light to a desired pattern, a substrate, an illumination optical system (projection lens system) that projects the patterned beam through the space in the projection lens system (optical element) onto the surface of the substrate. Hase, in col 3, lines 1-54, in col 4, lines 38-60, and in col 5, lines 33-35, discloses that the composition in the illumination optical system, (in the projection lens system, lens, mirrors etc., optical elements) can be utilized to clean the surfaces of the exposure apparatus (includes optical element, i.e., remove contaminants from a surface of the apparatus). Hase, in col 4, lines 1-60, discloses that the oxygen

and nitrogen is mixed in the projection system and impinged with a laser light treatment that inherently produces oxides including oxides of nitrogen (nitrogen dioxide) (claims 1-2, 9-11, and 19). Hase, in col 3, lines 45-52, in col 4, lines 1-60, discloses that the space in the illumination optical system is filled with oxygen and nitrogen gases (composition is in gaseous state) and activated via the impinging of the laser light (part of the radiation system, light source (ArF, DUV source) through the projection lens system (illumination optical system) causing both exciting and dissociation of molecules, thus producing a reactive species of the composition in the optical element (claims 13-17, and 20).

The difference between the claims and Hase is that Hase does not disclose that the composition (gases) includes one or more perchlorinated, perbrominated or perbrominated C₁-C₆ alkanes.

Chan in the abstract, in col 2, lines 5-54, in col 4, lines 28-58, discloses that the optics in a lithographic chamber is cleaned using perhalogenated alkane such as tetrafluoromethane as the gaseous composition that is activated by the EUV source (light source chamber).

The difference between the claims and Hase in view of Chan is that Hase in view of Chan does not disclose the perhalogenated alkane is one or more perchlorinated, perbrominated or perbrominated C₁-C₆ alkanes.

Anton, in col 5, lines 1-9, in col 7, lines 60-68, in col 8, lines 1, discloses that a surface is cleaned by vapors of an azeotropic mixture that comprises chlorinated alkane.

Therefore, it would be obvious to a skilled artisan to modify Hase by employing the fluorocarbon etchants suggested by Chan because, Chan, in col 4, lines 28-35, discloses that for mirrors (that are part of the collector optics, or projection lens system) that require a precise etch (for cleaning, removing debris) a fluorocarbon etchant can be utilized. It would be obvious to a skilled artisan to modify Hase in view of Chan by employing chlorinated alkanes in the cleaning gas mixture as suggested by Anton because Anton, in col 8, lines 1-2, discloses that using the cleaning gas mixture that includes chlorinated alkanes enables a surface cleaned that has no visible residue remaining on it.

5. Claims 5-6, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,252,648 (Hase et al., hereinafter referred to as Hase) in view of U. S. Patent No. 6,968,850 (Chan et al., hereinafter referred to as Chan) and U. S. Patent No. 5,221,361 (Anton et al., hereinafter referred to as Anton) as applied to claims 1-2, 9-11, 13-17, 19-20 above, and further in view of Journal of Crystal growth 222 (2001) 452-458 (McGinnis et al, herein after referred to as McGinnis)

Hase in view of Chan and Anton is discussed in paragraph no. 4.

The difference between the claims and Hase in view of Chan and Anton is that Hase in view of Chan and Anton does not disclose (i) that the composition introduced includes one or more nitrogen hydrides (claim 5), and ii) that the one or more compounds include one of the compounds recited in claim 6.

McGinnis, on page 452-453, discloses that the ammonia flux is introduced into the plasma atmosphere, i.e., a composition that includes one or more nitrogen atom,

and is a nitrogen hydride, and includes upon dissociation due to irradiation with plasma hydrogen atoms and nitrogen atoms, prior to exposing the substrate.

Therefore, it would be obvious to a skilled artisan to modify Hase in view of Chan and Anton by introducing the plasma atmosphere with ammonia because McGinnis, in the abstract, discloses that the ammonia flux introduced into the plasma beam resulted in the inhibition of surface roughening and produced a relatively smooth substrate surface.

6. Claim 7, is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,252,648 (Hase et al., hereinafter referred to as Hase) in view of U. S. Patent No. 6,968,850 (Chan et al., hereinafter referred to as Chan) and U. S. Patent No. 5,221,361 (Anton et al., hereinafter referred to as Anton) as applied to claims 1-2, 9-11, 13-17, 19-20 above, and further in view of U. S. Patent No. 5,320,707 (Kanekiyo et al, hereinafter referred to as Kanekiyo).

Hase in view of Chan and Anton is discussed in paragraph no. 4.

The difference between the claim and Hase in view of Chan and Anton is that Hase in view of Chan and Anton does not disclose that the one or more compounds include nitric acid (claim 7).

Kanekiyo, in col 23, lines 65-68, discloses that the nitric acid is introduced into the plasma to perform passivation processing on the laminate layers.

Therefore, it would be obvious to a skilled artisan to modify Hase in view of Chan and Anton by introducing the plasma atmosphere with nitric acid because Kanekiyo, in

col 23, lines 65-68, and in col 24, lines 1-2, discloses that nitric acid passivation enables the removal of residues on the laminate layer prior to development (washing processing).

7. Claim 18, is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,252,648 (Hase et al., hereinafter referred to as Hase) in view of U. S. Patent No. 6,968,850 (Chan et al., hereinafter referred to as Chan) and U. S. Patent No. 5,221,361 (Anton et al., hereinafter referred to as Anton) as applied to claims 1-2, 9-11, 13-17, 19-20 above, and further in view of U. S. Patent No. 6,225,032 (Hasegawa et al., hereinafter referred to Hasegawa).

Hase in view of Chan and Anton is discussed in paragraph no. 4.

The difference between the claim and Hase in view of Chan and Anton is that Hase in view of Chan and Anton does not disclose that the composition is encapsulated in a microporous media (claim 18).

Hasegawa, in col 9, lines 54-57, discloses that the composition (fluorine containing compound) is encapsulated in a sponge i.e., a microporous media.

Therefore, it would be obvious to a skilled artisan to modify Hase in view of Chan and Anton by using a sponge to encapsulate the composition because Hasegawa, in col 9, lines 54-60, and in col 10, lines 5-12, discloses that the laser irradiates the sponge and thus dissociates the fluorine containing compounds present in the sponge into highly reactive fluorine atom that can cause surface modification of by products created by laser irradiation.

Response to Arguments

8. Applicant's arguments, see Remarks, filed November 20, 2008, with respect to the rejection(s) of claim(s) 1-2, 9-11, 13-17, 19-20 under 35 USC 103 (a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made further in view of U. S. Patent No. 5,221,361(Anton et al., hereinafter referred to as Anton).

A) Applicants argue that neither Hase, nor Chan, nor McGinnis, nor Kanekiyo, nor Hasegawa teaches "a composition containing.....one or more perchlorinated, perbrominated, or periodinated C₁-C₆ alkanes".

None of the references cited in argument A) are relied upon to disclose this limitation. Anton, in col 3, lines 3-20, in col 5, lines 1-8, in col 7, lines 60-68, and in col 8, lines 1-2, discloses the use of chlorinated hydrocarbons such as dichloromethane or methylene chloride as cleaning gases to remove residues from a surface.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John A. McPherson/
Primary Examiner, Art Unit 1795

dcd

February 16, 2009.